Five honored as LANL Fellows for 2011

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LOS ALAMOS, New Mexico, January 13, 2012—Five scientists from Los Alamos National Laboratory have been honored by Laboratory Director Charles McMillan as Laboratory Fellows.

Laboratory Fellows are honored for their sustained,high-level achievements in programs of importance to the Laboratory either a fundamental or important discovery that has led to widespread use or and having become a recognized authority in the field, including outside recognition and an outstanding record of publications. "The Fellows we welcome this year represent the deeply talented pool of scientists at Los Alamos —world leaders in their fields—and we are honored that they are part of our national security science team. Los Alamos has a history of vital contributions, both in basic science and in applied science advancing national security, and these individuals are essential tomaintaining that capability," said Alan Bishop, principal associate director for Science, Technology, and Engineering at LANL.

The Fellows organization was established in 1981 and comprises technical staff members who have been appointed by the Laboratory director to the rank of Fellow in recognition of sustained outstanding contributions and exceptional promise for continued professional achievement. Fellows are limited to 2 percent of the Laboratory's technical staff. They advise management on important issues, promote scientific achievement, and organize symposia andpublic lectures. The organization administers the annual Fellows Prize for Outstanding Research in Science or Engineering and the Fellows Prize for Outstanding Leadership in Science or Engineering.

The new Fellows are Bruce Carlsten, Mike Leitch, Michael MacInnes, Richard Martin, and Amit Misra. The 2011 Fellows were selected from a field of 17 nominees, and a committee of scientists and engineers from across the Laboratory reviewed the nominations and recommended finalists who were confirmed by the Laboratory Director.

Bruce Carlsten, of the Accelerator andOperations Technology Division's High-Power Electrodynamics Group, is a pioneer in the production and use of high-brightness electron beams with applications that span a range of Laboratory programs and which have found widespread usage worldwide. His discovery of techniques that have enabled unprecedented beam brightness has led to a new generation of intense free electron lasers, including the Laboratory's Navy Free Electron Laser, and MaRIE, a premier X-ray FEL facility that is currently in design. These ideas are of such fundamental importance that virtually every free-electron laser in the world has embraced them. As group leader of High-Power Electrodynamics, he has overseen a rapid growth in beam-based applications at the Laboratory including microwave tube development and advanced acceleration concepts, owning six patents in these

areas. An APS Fellow since 2005 and recipient of the 1999 Accelerator School Prize for Achievement in Accelerator Physics, Carlsten is recognized internationally as an expert in accelerator physics and is considered among the best and most influential accelerator and FEL physicists in the nation.

Mike Leitch, of the Subatomic Physics Group, is an internationally recognized leader in the study of nuclei and nuclear interactions involvingquarks and gluons. One of his letters of reference called labeled him "the" world expert on how binding a nucleon within a nucleus affects the nucleon's ability to produce heavy quarks in high-energy collisions. He is recognized as the leading experimental expert on the effects of nuclear matter on production and propagation of bound states of heavy quark-antiquark pairs. Such pairs are a key probe tool of color screening in quark gluon plasma and have been discovered to be suppressed in high-energy heavy ion collisions. The fact that Leitch holds several of the most important scientific leadership roles within the PHENIXPhysics Working Group on heavy quarks demonstrates the high esteem in which the community holds him. He has given 45 invited talks, delivered several plenary lectures at top international conferences, and has over 200 publications with more than 13,000 citations (12 having more than 250 citations each). He was elected a Fellow of the American Physical Society in 2001.

Michael MacInnes, of the Applied Physics Improvised Foreign Design Group, is a leader in nuclear weapons evaluation who has developed and refined the science of weapons assessment, and introduced newdiagnostic capabilities into our evaluation arsenal. MacInnes's deep understanding of the breadth of nuclear science, radiochemistry, weapons physics, and experimental science at the Los Alamos Neutron Science Center (LANSCE) and critical assembly facilities contributes consistently to weapons program requirements and global security programs. His insight into radiochemical analyses and development of new metrics utilizing available data from the test program has lead to new evaluation diagnostics, increasing the fidelity of radiochemistry as a tool. MacInnes represents one of a very few technical experts who has the stature to affect national policy relating to the evaluation of nuclear weapons. MacInnes received a Letter of Appreciation from Steven Aoki, deputy under secretary of energy for counterterrorism, for service as project leader for nuclear counterterrorism in 2010. He has contributed to numerous classified reports, publications and proceedings. MacInnes received the Defense Programs Award of Excellence recognition for contributions to the Stockpile Stewardship Program, the W-76 Dual Revalidation Project, and the Divider Radiochemical Diagnostics Project; a LANL Distinguished Performance Individual Award, a LANL Distinguished Performance Small Team Award as a member of the Fission Basis Team, and three LANL Distinguished Performance Large Team Awards as a member of the National Technical Nuclear Forensics (Attribution) Simulation Team, the Combined Nuclear Test Response Team, and the EDOTX forAttribution Team; the NNSA Recognition for Excellence; and two awards from the National Intelligence Council.

Richard Martin, of the Theoretical Division's Physics and Chemistry of Materials Group, is an international leader in electronic structure theory of molecules and solids. He has done seminal work on electronic properties of actinides, transition metal complexes, and polymers using density functional theory, relativistic effective core potentials, and excited state theories. His groundbreaking density functional approaches are used in VASP, the most widely used suite of programs for band structure calculations of solids. He has 183 publications, 6 book chapters, and nearly 7,300 citations. He is a fellow of AAAS and received a DOE Award of Excellence (Pit Lifetime Assessment

Team). He was a member of the DOE Advisory Team for the NWCHEM Review, a member of the NSF Alliance Allocations Board and the National Resource Allocations Committee, a panel member of several DOE/BES workshops, and editor of the Wiley Series in Theoretical Chemistry. Martin also is a consultant to DuPont. Bill Goddard (Caltech, NAS member) states that Martin "has proved to be a virtuoso in developing first principles quantum methods" and refers to him as "one of the best in the world for such difficult problems." Alfred Sattelberger (Argonne Associate Laboratory Director) affirms that Martin is "one of the key reasons that Los Alamos is regarded as the top chemistry organization in the entire DOE complex."

Amit Misra has had a tremendous impact on the field of structural materials. He has pioneered the development of metal nanostructured multilayers for a range of structural applications, and he has defined this class of materials as a critical platform for understanding the underlying principles that drive new discoveries. His work on plastic flow stability provided theinsight into the development of damage-tolerant nanocomposites that is being explored in the Energy Frontier Research Center at Materials and Irradiation Extremes, for which he serves as codirector. Misra has also explored thermal and irradiation stability of nanolayered materials. Through this work, he discovered that interfaces can trap and annihilate radiation-induced point defects, which has significant implications for the design of new radiationtolerant materials. Another important discovery made by Amit was his research on nanometer-spaced preferentially aligned twins in sputter-deposited face-centered cubic metals is expected to lead to the development of high tensile strength electrical conductors. His cumulative work earned him a 2008 LANL Fellows Prize for Research and has been published in more than 220 peer-reviewed journal articles (in excess of 2,400 citations) and five book chapters.